and the brilliancy of any orb, its "magnitude" in fact, will therefore depend on its age, quite as much as on its size or distance. On this view, Sir W. Herschel's method of "star gauging" cannot be relied on for a correct determination of the actual shape of the cluster called the "Milky Way," as instead of taking the average of brightness only, as an indication of the average of distance, we have to superadd the average of age. Now, the smaller the star, the more quickly will its light die out, and, therefore, the necessary extent of our galaxy is immensely reduced; in other words, it appears that while the space separating us from the nearer stars, for which parallax has been obtained, remains of course unchanged, the computed distances of those hitherto considered to be farthest off, will be much lessened, as there appears to be no reason for concluding that telescopic stars are necessarily more distant than bright ones for which we cannot obtain parallax, but simply that they are older, or smaller, or both, and therefore dimmer.

Mr. Proctor, in "Other Worlds than Ours," argues that as telescopes barely reach the outermost stars of our own cluster, therefore it is impossible that they should reach to and resolve clusters constituting other systems and lying at distances enormously greater, and therefore that the resolvable nebulæ must lie within our galaxy. If my idea that the stars of our cluster which the telescope shows with difficulty, are not distant but dim, be correct, Mr. Proctor's argument appears to lose its force.

It will be readily allowed that if the light of the stars be fading away, a vast number may have already become extinct, and that it is indeed possible that the orbs now visible may be but a small surviving remnant of far greater multitudes which once illumined the heavens. If our cluster then be much reduced in extent, and its constituents be largely increased in number, it would follow, I imagine, that the chances against collision would be much reduced, and it then becomes less difficult to conceive the possibility of such an event having occurred in the case of the recent outbreak in τ Coronæ Borealis, especially if it were caused by the unobserved approach of an extinct body. This outbreak is usually ascribed to a sudden conflagration of hydrogen, the star being, as Prof. Roscoe says, "on fire." But a star self-luminous surely must be always on fire, and if it contain hydrogen, that gas must be in a state of constant conflagration. The temporary brilliancy of the star seems rather such as would be occasioned by a collision with some comparatively small body, whose impact was yet sufficient to generate heat enough to accomplish its own disintegration and ignition. Let us suppose that collisions are possible, and that their frequency is merely a question of the chances. What would be the consequences of such an event? I imagine that they would depend chiefly on the relative momenta of the colliding bodies; that if one were very much larger than the other, and the velocities high, the temperature would be raised sufficiently to dissipate the smaller into gas, while merely heating, or possibly liquefying the larger. If the bodies were nearly of a size, and their momenta were great, possibly both would be reduced to a gaseous condition; in either case their tendency would be to form ultimately a body equal in weight to the sum of its two constituents. Either the larger body would annex the smaller, or, if both became nebulous, the fervid gases would radiate their heat and contract anew into a system possibly containing a sun and planets.

Again, supposing that two bodies approach each other in such a manner as to avoid a collision, that is, so that their mutual gravity causes them to leave their paths and revolve round each other, we should have the explanation of the existence of double, treble, multiple stars; we should also understand how it happens that some stars (Sirius, for instance,) are accompanied by non-luminous orbs. Also, it would seem that if extinct stars are really far more numerous than is generally supposed, the theory which regards the revolution of attendant dark bodies as one cause of the variability of certain stars, receives fresh support.

Thus, in the course of time, nebulæ would form suns, suns would grow cold, or, while yet glowing, would come into contact and combine with other suns, till gradually space would be peopled with suns, larger and larger, but less and less thickly strewn. Pursuing the idea, we arrive at a period when all the stars of each galaxy shall become agglomerated into one mighty globe—nay, when all these vast galactic suns shall come together and form one solitary orb, in which all the matter once scattered through space shall be collected, accomplishing its successive fates as a sun without a system—a world without a sun—a cold and naked ball.

EARDLEY MAITLAND

Why is the Horse Chestnut Tree so called?

DURING the spring this tree is the ornament and pride of our public and private parks. In "Woodland Gleanings" it is stated to be a native of the north of India, and is supposed to have been introduced into England about 1575.

Our observant forefathers have given it the very significant name of *Horse* Chestnut (*Castanea Caballina*),* to distinguish it from all other species of chestnuts. The *reason* for so doing I have never seen stated in print; but from the three specimens of cuttings from a branch of this tree which I enclose, it will be very manifest. All over its branches, at every bud, can be seen what at a glance will be taken for an exact conformation of the *foot of a horse*, exhibiting the hoof, the nails of the shoeing, the fetlock-joint, &c., in marvellous miniature, some, of course, better developed than others. This curious freak in nature's vegetable kingdom, has, no doubt, been the origin of our nomenclature of this tree; and it would be an interesting point of philological inquiry to ascertain *whether or not its native Asiatic name has incorporated or associated with it that of the horse?*

I write with the view of eliciting information on this point, and with the hope, too, that some of your botanical contributors will throw further light on this peculiarity.

EUGENE A. CONNELL

Fall of an Aerolite

A LETTER of the year 1628, "sent by Mr. John Hoskins, dwelling at Wantage, in Berkshire, to his son-in-law, Mr. Dawson, a gunsmith dwelling in the Minories without Aldgate," and preserved among Nehemiah Wallington's Historical Notices (i. 13) contains the following narration:—

"On Wednesday before Easter, being the ninth of April, about six of the clock, in the afternoon, there was such a noise in the air, and after such a strange manner, as the oldest man alive never heard the like. And it began as followeth:—First, as it were, one piece of ordnance went off alone. Then after that, a little distance, two more, and then they went as thick as ever I heard a volley of shot in all my life; and after that, as if it were the sound of a drum, to the amazement of me, your mother, and a hundred more besides; yet this was not all, but, as it is reported, there fell divers stones, but two is certain, in our knowledge. The one fell at Chalows, half a mile off, and the other at Barking, five miles off. Your mother was at the place where one of them fell knee deep, till it came at the very rock, and when it came at the hard rock it broke, and being weighed, all the pieces together, they weighed six-and-twenty pound. The other that was taken up in the other place weighed half a tod, 14 pound."

I do not know whether there may be any other record of this remarkable aerolite, so simply but graphically described. Is it not just possible that some of the fragments may yet be preserved in the neighbourhood of its fall? At any rate a search would involve but little trouble.

T. W. WEBB

ANDERSON'S UNIVERSITY

WE extract the following from the *Evening Citizen* (Glasgow) of June 22:—

"The annual meeting of the trustees of Anderson's University was held this afternoon within the institution. Mr. William Ewing, in the absence of the president, was called to the chair. In the annual report which was submitted, reference was made to the death of Dr. Penny in November last, and the appointment of a successor. Mr. Young, of Kelly, who had arranged to set aside 10,000 guineas for the endowment of a Chair of Technical Chemistry in connection with the University, had, it was stated, no further proposal to make, he leaving it to the trustees to make what alteration in the deed of trust they may think proper. Under these circumstances, the managers recommended that advertisements be issued for a successor to Dr. Penny; that the chair should in future be styled the Chair of Scientific Chemistry; and that in electing the professor power should be reserved to the trustees to create such other chair or chairs of Chemistry in connection with the University, and elect such additional professor or professors to fill said chairs as the trustees may see fit; and also to arrange and define, from time to time, the respective departments of the subject to which each professor, including the Professor of Scientific Chemistry, should devote himself. Regarding the mode of electing professors, the managers recommended that no change should be made. The earlier practice was to appoint the professor only for a course of lectures, and upwards of fifty years ago a bye-law was passed that the election of a professor should be only for one session. With a few exceptions, the election of professors has been annual from that date down to the present time, and the power of not re-electing has been of great service, says the report, in the management of the University. Dr. Steven introduced a motion to abolish the annual election of professors. He spoke of the present system as most degrading. It struck at the root of the institution's claim to be a university; and while it was evidently contrary to the will of the founder, Dr. Anderson, he had heard of no case in which it had been of benefit. Mr. Kidston, secretary, remarked that many years ago it had been the means of causing the protessors to pay up their rent. Dr. Steven said he had heard it remarked that the trustees might come to look upon security for rent as a qualification in their professors of more consequence than educational ability. The professors, he contended, should be elected *aut vitam aut culpam.*—Dr. Pirrie seconded the motion. An amendment was moved by Mr. M'Lelland for having no alteration in the present system. Dr. Adams supported the motion in a speech of some length, in which he characterised the annual election of professors as somewhat disreputable. The chairman recommended that no alteration should take place. All the other officials, he argued, were elected annually, and why not the professors? Dr. Weir asked an explanation of the paragraph in the report which stated that the system had been found to be of great service. Mr. Kidston, by way of reply, again instanced the refusal of the professors to pay rent. On a division, the amendment was carried by 35 as against 6. The meeting was proceeding to some routine business when our reporter left."

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* The scientific name of the horse-chestnut is *Æsculus hippocastanum* it has no relationship to the *Castanea*, or sweet chestnut.—[ED.]

We had hoped that the trustees of Anderson's University would have made good use of the opportunity which exists at the present time, in consequence of the vacancy in the chair of Chemistry and of Mr. Young's munificent offer to endow a professorship of Practical Chemistry, to make some alterations in the status of the professors of the institution, but we seem doomed to disappointment. The professors are still to be appointed yearly, to give one course of lectures, and to have the privilege of paying rent for their laboratories and class-rooms in the meantime. The consequence of this will be that no chemist of eminence will be induced to undertake the duties of a post in which he will find himself on the same footing with *other officials,* doorkeepers, and laboratory man, we suppose; and we shall be much surprised if anyone will be found to apply himself solely to the duties of the appointment if he is to be liable to find himself turned out at the end of a year. The principal portion of his time must necessarily be devoted to commercial work and other means of obtaining a living, to the great detriment of scientific research, and certainly not to the credit of an institution which claims to be a university.

THE MICROSCOPE

CHOICE OF A MICROSCOPE.—Medical and other students are at this time of the year purchasing a microscope with which to begin the investigation of animal and vegetable structures. Others who would wish to invest in an instrument are deterred by the expense on the one hand and by the fear of obtaining a worthless thing on the other. Too strong a protest cannot be made against the notions prevalent with regard to microscopes, and encouraged by most of the makers in this country. The handsome-looking instrument of great size, with its long tube and innumerable wheels, is not to be recommended to the would-be observer, even should he feel justified in the expenditure. The microscopes which are used in most of the German laboratories where so much thorough work is done (to the writer's knowledge in Prof. Stricker's and Prof. Rokitansky's laboratories at Vienna, in Prof. Schweigger Seidel's at Leipzig, and in Prof. Claude Bernard's at Paris), are the little instruments of Hartnack, which do not stand above ten inches high, with a simple but large stage without any movement, no rackwork to the tube, but a sliding motion and a fine adjustment. The instrument is used in the vertical position with complete comfort, and when liquid is on the stage, this position being necessary, it is of considerable advantage to have a small microscope over which one can easily bend the head. Large microscopes, with their complicated machinery, are made to suit the optician who sells them, and not for the convenience of the observer. Those who wish to get a microscope should insist either on having one of these small and handy instruments made, or order one from M. Verick or M. Hartnack in Paris. Such a body having been purchased at a very minimum of cost, a larger sum may be expended on the really essential part of the apparatus, namely, the lenses. And here it will be found of great advantage to have the tube of the microscope not more than three-and-a-half or four inches in length, for then the objectives of the continental makers can be used with the greatest advantage, though, with proper care as to the ocular or eye-piece, they may be used on our ordinary long-tubed awkward English microscope. It is almost incredible that the English makers of object-glasses continue to demand three, or even four, times the price for their lenses which foreign makers do for lenses in every respect as good. For two pounds an object-glass may be obtained of M. Verick or M. Hartnack, of Paris, No. 8, which is quite as good a glass and in some respects more pleasant to use than the one-eighth, for which English opticians demand eight guineas. Many persons anxious to work with the microscope are deterred by the price of really first-rate instruments in this country. What we urge upon them most earnestly is to purchase such a body with eye-piece as that described above—simple but strong and steady—for between two and three pounds, and to equip the instrument with the objectives of MM. Verick or Hartnack, say No. 2, No. 5, and No. 8, which can be obtained for another four pounds. We shall have occasion again to speak of the merits of English and foreign objectives, especially of the immersion object-glasses. At present we speak from personal experience, and desire to point out the convenience and cheapness of the small microscope-body, and the thorough excellence and immensely diminished cost of the French makers' object-glasses.

Cutting Sections of Tissues.—The method of "embedding" first practised by Stricker and Klebs is now extensively used in Germany, and is of very great assistance to the practical histologist. It consists simply in surrounding the object from which sections are desired, with either paraffin, stearine, or a mixture of wax and oil. This latter is preferred at Vienna by Prof. Stricker and Dr. Klein, his assistant, and can be obtained of the exact consistency which may be desired; usually equal parts are to be used. A little tray of paper is made, and some of the wax composition in a melted state is poured in. The object to be cut is then placed in the tray, and more composition added, till the object is thoroughly enclosed. When hard, sections of the mass can be cut, the advantage being in the case of thin laminæ or processes, that a complete support is offered by the surrounding composition, and a uniformly thin cutting may be obtained. For some purposes the microtome of Dr. Ranvier, of Paris, is very useful: it is similar to one recently brought out by Mr. Stirling, of the Anatomical Museum, Edinburgh. In this little instrument we have a flat piece of brass with a hole in the centre, leading into a cylindrical chamber, at the bottom of which a screw works. A piece of elder-pith is excavated, so as to hold the tissue to be cut; and when this has been well fixed in it, the pith is squeezed into the cylindrical box through the hole in the brass plate. A razor drawn along the surface of the brass plate cuts through the pith and the tissue it embraces, leaving a surface perfectly smooth and continuous with that of the plate. A turn of the screw, which works into the cylindrical box, now causes a certain very small thickness of the pith and tissue to project above the plate, and the razor again drawn across and pressed on to the surface of the brass plate, cuts a fine section, the exact thickness of which may be nicely regulated by the screw which pushes up the pith. This little instrument may be obtained at a small cost from M. Verick, 2, Rue de la Parcheminnerie, Rue St. Jacques, Paris. It is not unlike an instrument described in English books on the microscope for cutting sections of wood, but its application with the use of pith, previously much in use for making sandwiches with delicate tissues which had to be cut, increases its value greatly. As to knives to be used in making sections, though some large knives are made on purpose, there is nothing better than a first-rate broad-bladed razor. Dr. Meynert has cut his immense collection of brain preparations with a common razor.

Staining and Mounting Tissues.—The method which is now very extensively used in German histological laboratories for the study and preservation of all kinds of delicate tissues, such as sections of the developing hen's egg, morbid growths, fine injections, nerve tissues, &c., is as follows: The section, either from a fresh specimen or from one preserved in alcohol, is placed in a solution of carmine in ammonia, from which all excess of ammonia